

IN THE CLAIMS:

Please amend claims 1-3, 23 and 37 as follows, and please add new claims 39-60 as follows:

1. (Amended) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator configured to generate ~~generating~~ a stimulus and apply ~~whereby application of~~ said stimulus to stimulate ~~stimulates~~ a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes configured to detect ~~for detecting~~ a signal generated in response to said stimulus;

wherein said sensor comprises a connector configured to automatically ~~positions~~ position said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site;

and further wherein said sensor comprises a processor for processing said at least one signal from said detector to select

at least one electrode detecting at least one signal characteristic of said anatomical site.

2. (Amended) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator configured to generate ~~generating~~ a stimulus ~~whereby application of and apply~~ said stimulus to stimulate ~~stimulates~~ a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes configured to detect ~~for detecting~~ a signal generated in response to said stimulus;

wherein said sensor comprises a processor for processing said at least one signal from said detector to select from said plurality of electrodes at least one electrode detecting at least one signal characteristic of said anatomical site.

3. (Amended) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator configured to generate ~~generating~~ a stimulus ~~whereby application of~~ and apply said stimulus ~~stimulates~~ to stimulate a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes configured to detect ~~for detecting~~ a signal generated in response to said stimulus;

wherein said sensor comprises a connector configured to automatically ~~positions~~ position said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site.

4. (Original) The apparatus of claim 3 wherein said sensor is shaped to fit a lower extremity of said individual.

5. (Original) The apparatus of claim 4 wherein said lower extremity comprises the foot.

6. (Original) The apparatus of claim 3 further comprising a processor, said processor for processing said at least one signal from said detector to select at least one electrode detecting at least one signal characteristic of said anatomical site.

7. (Original) The apparatus of claim 3 wherein said physiological function comprises nerve conduction.

8. (Original) The apparatus of claim 7 wherein said nerve conduction comprises conduction of the tibial nerve.

9. (Original) The apparatus of claim 7 wherein said nerve conduction comprises conduction of the peroneal nerve.

10. (Original) The apparatus of claim 3 wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the peroneal nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second

anatomical site comprises a superficial location over the extensor digitorum brevis muscle of the foot.

11. (Original) The apparatus of claim 3 wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the tibial nerve, and said detector comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the abductor hallucis muscle of the foot.

12. (Original) The apparatus of claim 3 wherein said first anatomical site comprises the ankle ipsilateral to said second anatomical site.

13. (Original) The apparatus of claim 3 further comprising a positioning indicator for location over a third anatomical site.

14. (Original) The apparatus of claim 11 wherein said third anatomical site comprises the malleolus of the ankle joint.

15. (Original) The apparatus of claim 14 wherein said malleolus is ipsilateral to said second anatomical site.

16. (Original) The apparatus of claim 3 wherein said detector is physically connected to said stimulator by a semi-flexible connector.

17. (Original) The apparatus of claim 16 wherein said connector comprises a strip comprising electrical traces for signaling between said detector and said stimulator.

18. (Original) The apparatus of claim 3 wherein said electrodes comprise an electrode array in communication with a processor.

19. (Original) The apparatus of claim 18 wherein said electrode array comprises at least two independent interleaved bipolar recording elements.

20. (Original) The apparatus of claim 3 wherein said signal comprises a compound muscle action potential.

21. (Original) The apparatus of claim 20 wherein said compound muscle action potential is recorded over a motor point.

22. (Original) The apparatus of claim 3 wherein the weighted sum of the recordings of at least two electrodes comprises the detectable signal.

23. (Amended) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator configured to generate ~~generating~~ a stimulus

~~whereby application of~~ and apply said stimulus to stimulate  
~~stimulates~~ a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes configured to  
detect ~~for detecting~~ at least one signal generated in response  
to said stimulus;

wherein said sensor comprises a connector configured  
to automatically ~~positions~~ position said detector substantially  
adjacent to said second anatomical site when said stimulator is  
placed substantially adjacent to said first anatomical site on  
the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual.

24. (Original) The method of claim 23 further comprising:

(c) processing said at least one signal generated at said  
second anatomical site to select at least one electrode  
detecting said at least one signal characteristic of said second  
anatomical site;



(d) selecting at least one electrode in response to said processing according to step (c) from said plurality of electrodes; and

(e) performing nerve conduction studies of step (b) with said at least one electrode selected in step (d).

25. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of an F-wave latency.

26. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a motor latency.

27. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a sensory latency.

28. (Original) The method of claim 23 wherein said nerve conduction studies comprise measurement of a sensory amplitude.

29. (Original) The method of claim 24 wherein processing further comprises amplitude comparison between a plurality of signals generated at said second anatomical site.

30. (Original) The method of claim 24 wherein processing comprises frequency spectrum comparison between a plurality of signals generated at said second anatomical site.

31. (Original) The method of claim 23 wherein said at least one signal generated at said second anatomical site comprises peripheral evoked potentials.

32. (Original) The method of claim 29 wherein said amplitude comparison comprises maximal peak to peak amplitude.

33. (Original) The method of claim 30 wherein said frequency spectrum comparison comprises discrete Fourier transform analysis of said plurality of signals generated at said second anatomical site and comparison of the spectral components.

34. (Original) The method of claim 33 wherein said selected electrodes comprise electrodes with more energy at low frequencies.

35. (Original) The method of claim 23 wherein said at least one signal generated at said second anatomical site comprises compound muscle action potential.

36. (Original) The method of claim 23 wherein said at least one signal generated at said second anatomical site is recorded over a motor point.

37. (Amended) An apparatus for assessing physiological function in an individual, comprising:

stimulus means for producing a stimulus and for applying the stimulus at a first anatomical site to stimulate ~~whereby~~ a nerve ~~is stimulated~~;

detecting means comprising a plurality of electrodes for detecting at least one signal characteristic of a second anatomical site generated in response to said stimulus; and

connecting means for connecting said stimulus means and said detecting means, ~~wherein~~ and said connecting means configured to automatically position said detecting means substantially adjacent said second anatomical site when said

stimulating means are positioned substantially adjacent said first anatomical site.

38. (Original) The apparatus of claim 37 further comprising:

processing means for processing said at least one signal from said detecting means.

39. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of and apply said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said

stimulator is positioned substantially adjacent to said first anatomical site;

wherein said physiological function comprises nerve conduction; and

wherein said nerve conduction comprises conduction of the tibial nerve.

40. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site;

wherein said physiological function comprises nerve conduction; and

wherein said nerve conduction comprises conduction of the peroneal nerve.

41. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the peroneal nerve, and said detector

comprises a shape to fit said second anatomical site, wherein said second anatomical site comprises a superficial location over the extensor digitorum brevis muscle of the foot.

42. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said stimulator comprises a shape to fit said first anatomical site, wherein said first anatomical site comprises a superficial location over the tibial nerve, and said detector comprises a shape to fit said second anatomical site, wherein

said second anatomical site comprises a superficial location over the abductor hallucis muscle of the foot.

43. (New claim) The apparatus of claim 42 wherein said third anatomical site comprises the malleolus of the ankle joint.

44. (New claim) The apparatus of claim 43 wherein said malleolus is ipsilateral to said second anatomical site.

45. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said



stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said first anatomical site comprises the ankle ipsilateral to said second anatomical site.

46. (New claim) An apparatus for assessing physiological function in an individual comprising:

a sensor, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting a signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is positioned substantially adjacent to said first anatomical site; and

wherein said signal comprises a compound muscle action potential.

47. (New claim) The apparatus of claim 46 wherein said compound muscle action potential is recorded over a motor point.

48. (New claim) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of said stimulus stimulates a nerve at said first anatomical site; and

a detector shaped to fit a second anatomical site, said detector comprising a plurality of electrodes for detecting at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said detector substantially adjacent to said second anatomical site when said stimulator is placed substantially adjacent said first anatomical site on the surface of an individual;

(b) performing nerve conduction studies with at least one electrode to assess physiological function in an individual;

(c) processing said at least one signal generated at said second anatomical site to select at least one electrode detecting said at least one signal characteristic of said second anatomical site;

(d) selecting at least one electrode in response to said processing according to step (c) from said plurality of electrodes; and

(e) performing nerve conduction studies of step (b) with said at least one electrode selected in step (d).

49. (New claim) The method of claim 48 wherein processing further comprises amplitude comparison between a plurality of signals generated at said second anatomical site.

50. (New claim) The method of claim 49 wherein said amplitude comparison comprises maximal peak to peak amplitude.

51. (New claim) The method of claim 48 wherein processing comprises frequency spectrum comparison between a plurality of signals generated at said second anatomical site.

52. (New claim) The method of claim 51 wherein said frequency spectrum comparison comprises discrete Fourier transform analysis of said plurality of signals generated at said second anatomical site and comparison of the spectral components.

53. (New claim) The method of claim 52 wherein said selected electrodes comprise electrodes with more energy at low frequencies.

54. (New claim) The method of claim 48 wherein said at least one signal generated at said second anatomical site comprises peripheral evoked potentials.

55. (New claim) A method for assessing physiological function in an individual, comprising:

(a) placing a sensor on an individual, said sensor comprising:

a stimulator shaped to fit a first anatomical site, said stimulator generating a stimulus whereby application of

said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said nerve conduction studies comprise measurement  
of an F-wave latency.

56. (New claim) A method for assessing physiological  
function in an individual, comprising:

(a) placing a sensor on an individual, said sensor  
comprising:

a stimulator shaped to fit a first anatomical site,  
said stimulator generating a stimulus whereby application of

said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said nerve conduction studies comprise measurement  
of a motor latency.

57. (New claim) A method for assessing physiological  
function in an individual, comprising:

(a) placing a sensor on an individual, said sensor  
comprising:

a stimulator shaped to fit a first anatomical site,  
said stimulator generating a stimulus whereby application of

said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said nerve conduction studies comprise measurement  
of a sensory latency.

58. (New claim) A method for assessing physiological  
function in an individual, comprising:

(a) placing a sensor on an individual, said sensor  
comprising:

a stimulator shaped to fit a first anatomical site,  
said stimulator generating a stimulus whereby application of

said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said nerve conduction studies comprise measurement  
of a sensory amplitude.

59. (New claim) A method for assessing physiological  
function in an individual, comprising:

(a) placing a sensor on an individual, said sensor  
comprising:

a stimulator shaped to fit a first anatomical site,  
said stimulator generating a stimulus whereby application of



said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said at least one signal generated at said second  
anatomical site comprises compound muscle action potential.

60. (New claim) A method for assessing physiological  
function in an individual, comprising:

(a) placing a sensor on an individual, said sensor  
comprising:

a stimulator shaped to fit a first anatomical site,  
said stimulator generating a stimulus whereby application of

said stimulus stimulates a nerve at said first anatomical site;  
and

a detector shaped to fit a second anatomical site,  
said detector comprising a plurality of electrodes for detecting  
at least one signal generated in response to said stimulus;

wherein said sensor automatically positions said  
detector substantially adjacent to said second anatomical site  
when said stimulator is placed substantially adjacent said first  
anatomical site on the surface of an individual; and

(b) performing nerve conduction studies with at least one  
electrode to assess physiological function in an individual;

wherein said at least one signal generated at said second  
anatomical site is recorded over a motor point.